膵臓の「レ」線感受性に関する実験的研究

(本論文の一部は第12回国立病院療養所綜合医学会及び日本医学放射線学会東海，北陸，関東合同部会に於て発表した．)

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The Experimental Studies on X-Ray Sensitivity of the Pancreas.

by

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内容抄錄

膵臓のレ線に対する態度を調べるため，健康なRatteの全身にレ線の一時全量照射（60r, 100r, 300r, 600r, 800r），遷延照射（300r），分割照射（30r×10）を行い，経時日的に膵組織を採取して，病理組織学的並びに組織化学的に検索を行つた．即ち，Haematoxylin-Eosin染色，Heidenhain或はAltmannのMitochondria染色，Feulgen氏核酸反応，Alkali-phosphatase反応，Alkali-Nucleotidase反応及び組織化学的Lipase反応等を行い，膵臓のレ線感受性を主として腺細胞につき，形態学的並に機能的両面より追求して次の如き結果を得た．

1) 腺細胞のMitochondriaはレ線に対して，非常に鋭敏に反応し，少量（60～100r）照射したものでも3時間目に既に，短縮，顆粒化或は被染色性の低下等種々の変化を示す．これらのMitochondriaの形態変化は照射後6～24時間目に最も強く現われ，以後漸次恢復する．変化度は照射線量に略々比例する．

2) Zymogenkörnerはレ線照射の影響を受け，少量照射（60～100r）では分泌機能の亢進が見られ，中等量以上照射（300～800r）では12～24時間目に凝集，大小不同，微細化，空胞化等の変化が著明となる．

3) 腺細胞核は形態変化と核機能の障碍を示す．特に6～12時間目に於ける形態変化と核機能の障碍が最も著明である。少量照射は軽度に核機能を刺戟するものゝ如くである．

4) Alkali-phosphatase, Alkali-nucleotidase反応は照射後12～24時間目に著明に減弱乃至は消失し反応の障碍度は照射線量に略々比例する．

5) 組織化学的Lipase反応はレ線照射により阻碍され，照射後12～24時間目に反応は著明に減弱乃至は消失し，3日目より漸次恢復する．反応の障碍度は照射線量に略々比例する．

6) 膵臓はレ線に対して可成の感受性を有し，中等量以上のレ線の全身照射により形態学的変化及び膵機能の障碍を惹起する．レ線の一時照射と遷延照射による形態学的変化及び機能障碍を比較して，両者の間には有意の差を認め難いが，分割照射法はこれら三照射法（一時，遷延，分割）中，膵組織に対して最も強く障碍的に作用する．

Summary

To examine the response of the pancreas to X-rays single (60 r, 100 r, 300 r, 600r, and 800 r), protracted (300r) and fractionated (30r × 10) irradiations were made on the total body of the healthy rat and the tissue of the pancreas was punched for pathohistological and histochemical examinations in the time course after the irradiations. For staining haematoxylin-eosin, Heidenhain or Altmann's mitochondria stain was applied and Feulgen's nucleic acid, alkaline phosphatase, alkaline nucleotidase and histochemical lipase reactions were examined. Thus the X-ray-sensitivity of the pancreas, especially of its glandular cells, was investigated both morphologically and functionally and the following results were obtained :

1. The mitochondria of the glandular cells responded quite sensitively to X-rays. Even in the animal which was irradiated with a relatively small dose (60～100r), the mitochondria showed various morphological changes : they shortened in length, took a granular shape and were stained less easily. Such changes were most marked 6～24 hours after the irradiation and thereafter recovered gradually.

The degree of the changes was roughly proportional to irradiated dose.

2. The "Zymogenkörner" were influenced by X-ray irradiation. With a small dose (60～100r) an exalted secretion was observed. With a dose above mediate, after 12～24 hours, such changes as agglutination, inequality in size, fractionation and vacuolization were apparent.

3. The nucleus of the glandular cell presented morphological change and functional disturbance. They were especially marked 6～12 hours after the irradiation. Irradiation with a small dose seemed to stimulate the function of the nucleus slightly.

4. Alkaline phosphatase reaction and alkaline nucleotidase reaction were markedly weakened or disappeared 12～24 hours after the irradiation. A parallelism was observed between the degree of the disturbance and the irradiated dose.

5. Histochemical lipase reaction was disturbed by X-ray irradiation. It was markedly weakened or disappeared 12～24 hours after the irradiation. It began recovering gradually after 3 days. The degree of the disturbance was roughly proportional to the irradiated dose.

6. The pancreas is considerably sensitive to X-rays. By irradiation with a dose above mediate morphological change and functional disturbance are evoked. When the morphological changes by single irradiation is compared to those by protracted, no significant difference is detected. Of the 3 irradiations, single, protracted and fractionated, the last affects the tissue of the pancreas most strongly.